DERBY CYCLE

powered by BionX™

# BionX

## User Manual

## *Congratulations*

Congratulations on your decision to purchase a product *powered by BionX*™. We are sure that your new electric bicycle will exceed your expectations in terms of function, design, and quality. All bicycles powered by the BionX system are manufactured with the latest production methods and high-quality materials. Please read this manual thoroughly so that you will enjoy your new electric bicycle for years to come.

Please make sure that your new electric bicycle was professionally assembled and adjusted by your authorized dealer, and handed over to you with the instructions. This manual serves as a supplement to the bicycle user manual. Should you have any questions after you have studied the manual, please contact your dealer.

## *User Precautions*

**We want you to have a fun ride, but also a safe one. Carefully read the following information, even if you are an experienced rider. Please familiarize yourself with your electric bicycle powered by the BionX system before you take your first trip.**

1. Read all of the enclosed installation and operating instructions from the manufacturer and follow the instructions, if any, prior to its first use.
2. Familiarize yourself with your electric bicycle and the functions of the BionX system in a safe environment before participating in road traffic for the first time.
3. Always wear a helmet when riding an electric bicycle for your own safety.
4. Make sure that the tires have correct pressure before riding the bike.
5. Make sure that the brakes are operating properly before riding the bike.
6. Make sure that the quick-release on the front wheel is securely fastened before riding the bike.
7. Do not use a mobile phone or any other electronic devices while riding an electric bicycle; it is imperative that you pay attention to traffic.
8. If possible, ride in bike lanes and always in the correct direction of traffic.
9. Adhere to all valid traffic regulations.
10. Keep in mind that other traffic participants may underestimate the speed of an electric bicycle.
11. Ride with both hands on the handlebars when riding your electric bicycle.
12. Ride as defensively as possible.

Thank you very much for your attention and we hope you enjoy your new electric bicycle *powered by BionX*.

Your BionX Team

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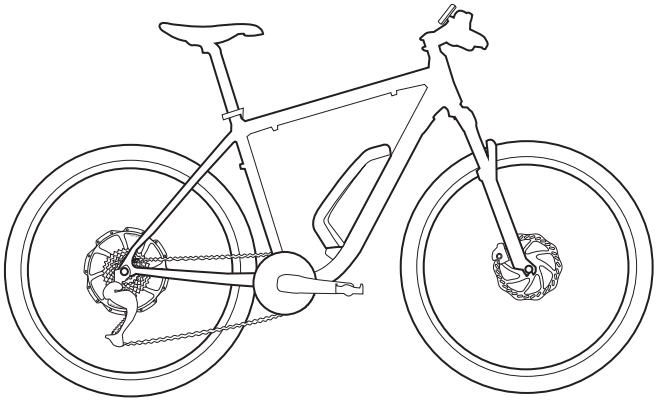
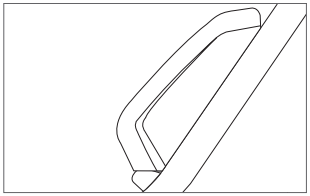
## *Description of the BionX Propulsion System*

Your electric bicycle is an EPAC (Electrically Power Assisted Cycle) in accordance with EN 15194 and differs from a bicycle that isn't electrically assisted.

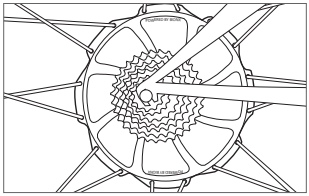


## *BionX Propulsion System Components*



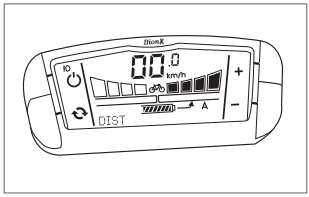
**1 Battery**

- Lithium Manganese (LiMn), 48V, 6.6Ah, 317Wh
- Removable, lockable
- Fully charged in: 3-4h



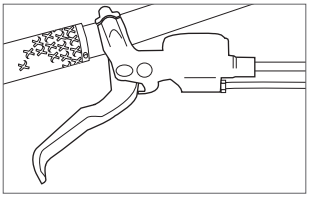
**2 Motor**

- DC rear hub motor
- Black, nom. 250W, nom. 9Nm / max. 40Nm, 4.7kg
- Brushless, gearless
- Generate mode for energy recuperation
- Integrated torque sensor



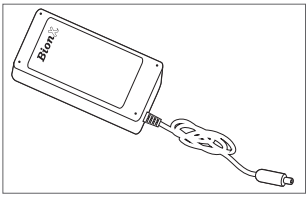

**3 Console**

- Removable
- Illuminated LCD display with battery state of charge
- 4 assistance levels
- 4 generate levels
- Backlight controls
- Offers cycle computer functions (speed, odometer, average speed, total distance)



**4 Brake switch**

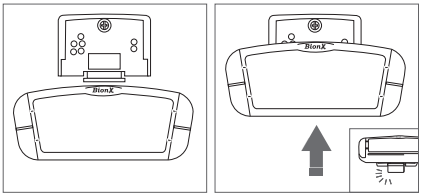
- A sensor integrated with the brake lever – connected to the BionX console
- Upon activation assistance is shut off ("kill switch") generate mode is activated




**Power Supply**

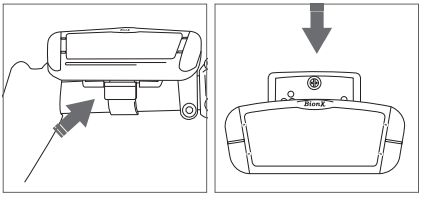
- Power supply to recharge the LiMn-battery
- Input voltage: 100-240V
- Output voltage: 26V
- Max. charge current: 3.45A
- Output: 90W

## *Inserting or Removing the Console*




**Inserting the console**

- Slide the console into the console mount on the handlebar
- Make sure that the console engages securely. When inserted correctly, you will hear an audible "click".




**Removing the console**

- Release the console by pushing the release lever on the console mount
- Slide the console out of the console mount

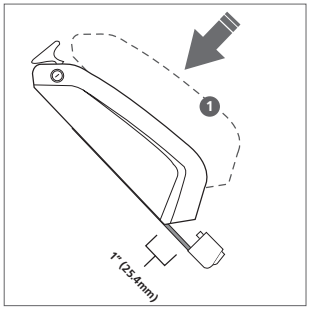
# *Inserting and Removing the Battery*

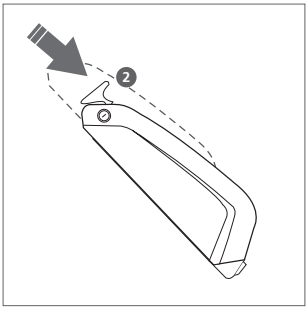
**Inserting the battery**

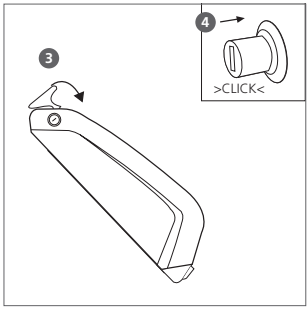
1. Place battery onto the docking station
2. Slide the battery down the rail gently towards connector
3. The release arm will close automatically as battery slides towards connector

**Do not force the battery arm closed, this can bend the battery connector**

4. With the release arm almost closed, hold it in place and simultaneously press in the lock cylinder – you will hear an audible >click< when the battery is properly inserted

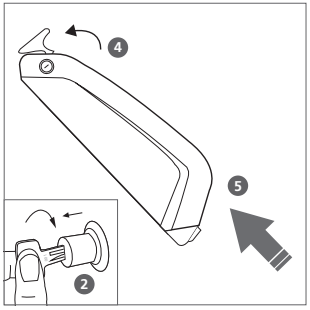


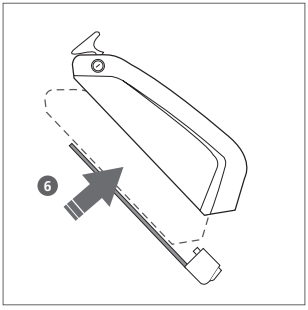




**Removing the battery**

1. Turn off the BionX propulsion system (no illustration)
2. Lightly press on the battery release arm, insert the key and turn clockwise
3. The lock cylinder will protract, freeing battery release arm (no illustration)
4. Remove the battery by opening release arm
5. Lift the battery from dock by sliding upwards
6. Remove the battery



# *Handling and Charging the Battery*

**WARNING**

**BionX batteries shall only be recharged with BionX chargers or BionX power supplies.**

**Never short circuit the battery by connecting the contacts of the battery. Never open the battery. This could damage the battery and possibly lead to overheating or ignition of the battery. The battery cannot be serviced by the user. Opening the battery case voids all warranty and product liability claims. Never use a battery which has obvious damage to the housing or the connector.**

Make sure that the battery is no longer connected to the power supply once the charging operation is complete. The Lithium Manganese battery cells have a low self-discharge rate, therefore a continuous connection of the battery to the power supply is not necessary. We recommend that you fully charge the battery when it will not be used for a longer period of time, for example, before storing it for the winter, and then recharge the battery at minimum every three months.
It is best to store the battery in a cool location at temperatures between 10 °C and 25 °C. Never store the battery in locations where the temperatures can reach more than 45 °C or fall below -10 °C. The battery should never be exposed to extreme temperature fluctuations or humidity, and always protect the battery during storage from humidity to prevent corrosion on the connectors. Never drop the battery, and protect it from physical damage. Damage may lead to short-circuits, and as a result cause overheating or ignition of the battery.

Used batteries may not be disposed of in regular household trash!
Be aware that used batteries must be disposed of properly!
DERBY BionX batteries can be returned at DERBY dealerships free of charge.

**Charging the battery:**

**WARNING**

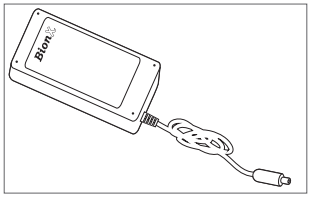
**Only use the BionX power supply that was supplied with the bicycle to charge the battery. The use of other power supplies can damage the battery.**

**The BionX power supply should be used exclusively for rechargeable batteries of the specified type. The use of the BionX power supply with batteries that are not rechargable may damage those and could lead to overheating, or ignition of the battery. Keep the power supply away from water or moisture when charging and/or connected to prevent electrical shock or short-circuits.**

**Do not use a power supply that has obvious signs of damage to the cable, housing or the connector.**

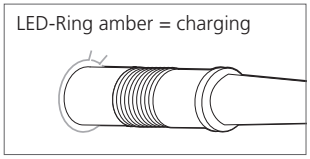
Extreme temperatures will affect battery life, especially during charging. Avoid charging in direct sunlight or in very hot or cold temperatures. This will reduce the life of the battery considerably. We recommend charging the battery at temperatures around 20 °C (room temperature). The battery should be warmed to room temperature before it is charged, particularly when it was exposed to cold temperatures during a ride.

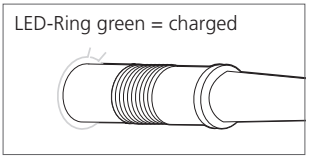
The battery can be charged when mounted on the bicycle or removed from the battery docking station. A Lithium Manganese battery does not have a memory effect, which means that the battery's maximum energy capacity is not affected if it is repeatedly recharged after only being partially discharged. The battery does not need to be completely drained before charging. We recommend charging the battery after every ride, preferrably when the battery state of charge display shows less than 50%. **We recommend that you fully charge the battery when it will not be used for a longer period of time, for example, before storing it for the winter, and then recharge the battery at minimum every three months.** When the battery is depleted to the level where there is risk it could fall into deep discharge, the battery will signal that a recharge is needed by beeping.




**Power Supply**
The delivered power supply is suitable for the voltage ranges 110-115V or 220-230V. There is no need to manually set the voltage range.

**Charging procedure**



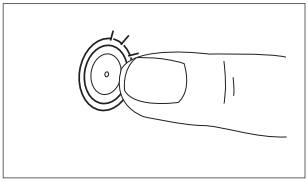




- Connect power supply and battery by inserting the charge connector into the touch port – the system can be turned on or off
- Connect the plug of the power supply with the power outlet
- The battery touch port (LED ring around the charging connector) lights up according to the actual state of charge of the battery and then turns to AMBER during the charging process
- After a complete charge the colour of the LED ring changes to GREEN. The battery is then fully charged and the charging process is complete
- Following this procedure the charging connector should be disconnected
- During the charging process you can check the battery state of charge through the console if the battery is connected to the system - system can be switched on while it is charged

The battery is fully charged after about 3 to 4 hours. Make sure that a completely charged battery is no longer connected to the charger after the charging procedure is completed.

**Checking Battery State of Charge**

- Swipe your finger slowly over the touch port.
- Battery state of charge LED will illuminate.



| Battery state | Colour |
|---|---|
| **100-85 %** | green |
| **85-25 %** | amber |
| **< 25 %** | red |

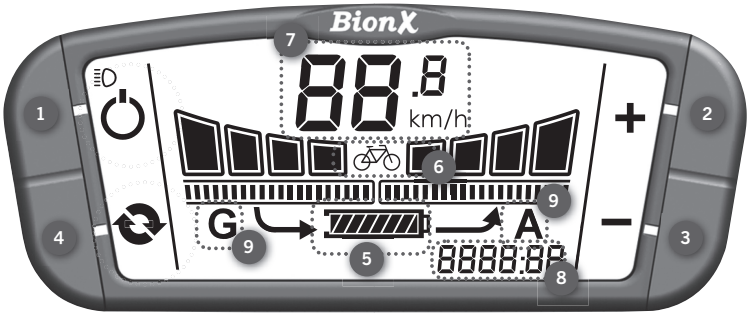
## *Assist Mode / Generate Mode*

The BionX propulsion system operates in four assist levels in the assistance mode, and in four charging levels in the generate mode. In the assistance mode, your pedalling is assisted proportionally by an electric motor that drives the rear wheel. A torque sensor is located on the axle of the electric motor and measures the effort provided by the rider; this produces natural feeling assistance from the motor.

When in generate mode the electric motor functions as a generator and recharges the battery. When going downhill, you can regulate your speed by varying the generate level. This generate function provides a certain braking effect, however it does not replace legally required brakes. If either one of the two brake levers (depending on bike model) is pulled, the drive system automatically enters generate mode. The range can therefore be extended up to 15%, depending on the road conditions.

| Assistance Level (A) | Degree of Assist | Riding Situation |
|---|---|---|
| **1** | 35% | Riding on level ground |
| **2** | 75% | Slight inclines, head wind |
| **3** | 150% | Steep hills, strong head wind |
| **4** | 300% | Very steep roads |
| **Generation Level (G)** | | |
| **1** | Slight downhill grade, tailwind | |
| **2** | Significant downhill grade, tailwind | |
| **3** | Steep descent | |
| **4** | Very steep descent | |

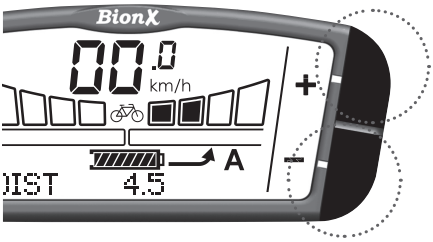
# *Operating the BionX Propulsion System*




1. ⏻ Power
2. ⊕ Key
3. ⊖ Key
4. Cycle
5. State of charge indicator
6. 🚲 (bicycle) mode
7. Speedometer
8. Trip distance/odometer/ chronometer/average speed
9. Assist (A) or generate level (G)

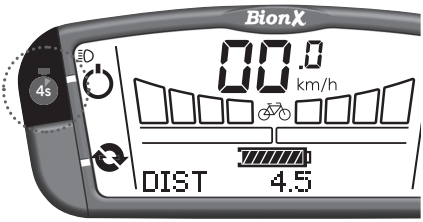
**Turn the system on**

Briefly push either the ⏻ key or ⊕ key. The battery will beep 4 times and you will see a countdown, this is the system perfoming a self check. After startup, the system is always in 🚲 mode (no motor assist/bike operation). To turn the system off, briefly push ⏻. The battery will beep 5 times. After 10 minutes of "no operation" the system turns off automatically.



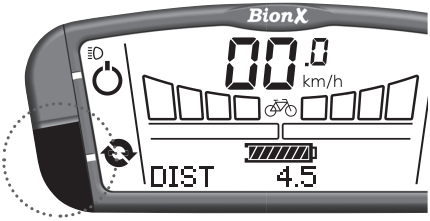

**Select assistance/generate level**

Push ⊕/⊖ key for more/less assist (see bar "fields 1-4" above display "A"). From 🚲 mode push ⊖ key to enter continuous generate mode.



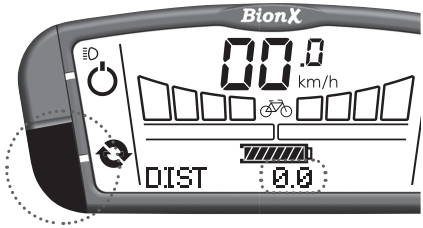

**Turn on display backlight**
Push and hold ⏻ key for 4 seconds - display backlight is turned on.

**Turn off display backlight**
Push and hold ⏻ key again for 4 seconds.




**Select the cycling computer functions**
Briefly push the ⟳ key to change between:

| | |
|---|---|
| Trip Distance | DIST |
| Odometer | ODO |
| Chronometer | CHRONO |
| Average Speed | AVSPD |




**To reset cycle computer functions**
Hold the ⟳ key for a few seconds to reset the distance, chronometer, and average speed values to zero.

# *Programming the Basic Settings*

In general, all basic settings for your electric bicycle are pre-set. If you happen to change tire sizes, during service, for example, you can reset the tire circumference to ensure the precise function of your speedometer. Furthermore, you can set the unit to display the speed, the strength of the recharge when triggering one of the two brake levers and the arrangement of the main functions. This is done by entering programming codes.

**Turn on the programming mode**
Simultaneously push ⏻ and 🔄 until the display shows "0000". The first zero blinks. Change the value of the selection with ⊕ or ⊖ and confirm with ⏻. Select the other digits in the same manner until the desired program is displayed.

| Code | Description |
|---|---|
| **2001** | Select km/h or mph |
| **2002** | Regeneration/brake output (for magnetic switch) 0-40 (ideally 30-40) |
| **2005** | Tire circumference (millimeters) |
| **2009** | Flip Display Plus/Minus 0 = power left, 1 = power right |

| Code 2001 | Code 2002 |
|---|---|
| Select unit - km/h or mph. Select with ⊕ or ⊖ and confirm with ⏻. | Default value: 30: adapt with ⊕ and ⊖. Confirm with ⏻. |

| Code 2005 | Code 2009 |
|---|---|
| Set tire size (in mm) - Select digits one after another with ⊕ or ⊖ and confirm with ⏻. | Current setting of main functions is displayed. Flip = 0, assist toggle is on the right side of console; Flip = 1, assist toggle is on the left side of console. Confirm with ⏻. |

**WARNING**
**Please do not use other programming codes without consulting your authorized dealer. If you type the wrong code, please push ⏻ key to exit programming mode.**

# *Installing/Removing the Rear Wheel*

We recommended the removal and installation of the rear wheel to be done by a qualified dealer. Should you have to do this yourself, please follow the instructions below:

**WARNING**

**Always turn off the propulsion system prior to plugging in or unplugging the motor cables.**

**CAUTION**

**It is absolutely essential that the axle nuts are tightened with a torque of 40Nm/30lb-ft; this ensures that the propulsion system functions properly. Ensure the torque reaction collar is fully inserted into the dropout.**

**Hydraulic disc brake: Do not pull the brake lever with the brake disc on the rear wheel removed from the caliper. Insertion of the wheel can be difficult or impossible as the brake pads will prevent brake disc from sliding in place.**

**To Remove the rear wheel**

- Make sure that the system is turned off
- Remove the neoprene covers (Fig. 1)
- Unplug the two cable connections that lead to the motor (Fig. 2)
  First COMMUNICATION ❶, then POWER ❷
- Disconnect the cable guide from the rear wheel brake (only on bicycles with V-brakes)
- Loosen the axle nut on the rear wheel using a 15mm ring wrench (Fig. 3)
- Slide the rear wheel downwards out of the drop out

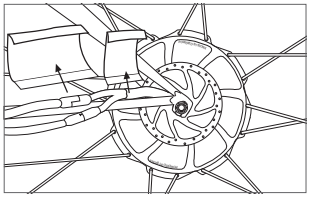


Fig. 1

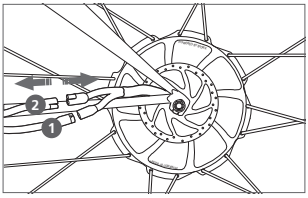



Fig. 2

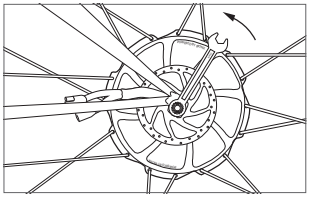
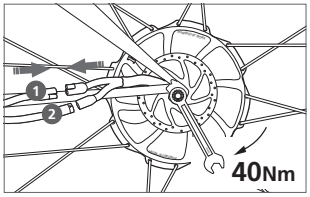
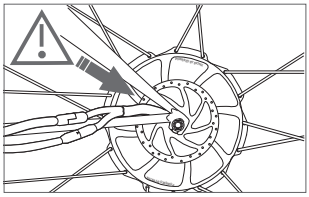
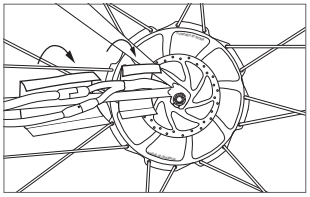


Fig. 3



**Installing the rear wheel**

- Guide the rear wheel axle into the two dropouts and make sure that the brake disc (on models with disc brakes) is inserted between the brake pads
- Also make sure that the flat area at the left of the rear axle (torque reaction collar) is aligned so that it fits into the left dropout
- Install the rear wheel with both sides of the axle inserted all the way in the dropouts
- Tighten the axle nuts on the rear wheel with 40Nm/ 30lb-ft (= VERY TIGHT!). This torque is essential for the correct function of the propulsion system. If you do not have a torque wrench, use a normal ring wrench. Have your dealer check the torque of the axle nuts as quickly as possible. Use only the original axle nuts; otherwise you run the risk of damaging the axle threads.
- Keep the motor cables clear of the brake disc (on models with disc brakes)
- Plug in the cable connections (POWER ❶ before COMMUNICATION ❷) and place the larger neoprene cover over the plug-in connections, and the smaller neoprene cover closer to the disc to prevent the cables from wear.
- Now replace the cable pull. Re-install the cable guide of the rear wheel brake (V-brakes only), and correctly adjust the rear wheel brake.

## *Maintenance and Care*

We recommend to have the spoke tension of the rear wheel and the torque of all screws checked by your qualified dealer after the first 200km.

In order to ensure extended use of the propulsion system, all plug-in contacts of the system should be checked every two to three months and cleaned with a soft and dry brush, if necessary. It must be ensured that no dirt or humidity penetrates the battery docking station when the battery is removed. The electric motor is a brushless DC-motor that does not have to be serviced.

## *Cleaning*

**CAUTION**

**Never use a high pressure washer or a garden hose to clean the propulsion system. The force of a water jet could damage the electrical components of the propulsion system.**

We recommend a soft sponge or a soft brush to clean the bicycle. Use a moist rag to clean the battery's docking station. Always use very little water and keep water away from the electrical contacts. Check the plug-in connections for moisture after cleaning and let these dry, if necessary, before reusing the bicycle.

## *Transporting an Electric Bicycle on a Car*

**WARNING**

**Make absolutely sure that the bike rack on your car is suitable for the increased weight and the unique frame style of your electric bicycle. A rack that is not suitable can be damaged or even break during the transport of the electic bicycle. The electric bicycle can be damaged by an unsuitable bike rack.**

For transportation of the electric bicycle on a bike rack always remove the battery and the console.

## *Repair and Spare Parts*

For repair of your electric bicycle consult your qualified dealer. All of the original spare parts for your electric bicycle can be purchased through your dealer. If you need spare keys for the battery, please contact your dealer. Please retain the key number for your records.

BionX Key Number

# *Troubleshooting*

**The system does not turn on**
Check the battery and make sure that it is charged. The battery must be correctly inserted in the docking station and the lock must be completely closed. Also check that all connectors of your wiring harness are properly engaged. If the problem persists, contact your authorized dealer.

**The system can be turned on but there is no assist**
Check that the cables running from the battery to the motor are properly connected. If the problem persists, contact your authorized dealer.

**The system is continuously in generate mode**
When the propulsion system is continuously in generate mode and cannot be switched back to assist mode by pushing the ⊕ key, the problem most likely lies with the brake switches that are located at the brake levers. In this case try to "repair" the system by turning it off and then on again. If that does not solve the problem, you can temporarily bypass it by removing the plug-in connection from the console to the brake-switch.

**WARNING**
**If you bypass the brake switches you also disable regenerative breaking.**
**In doing so your system will not provide any brake support.**
**We recommend that you contact your dealer as soon as possible.**

**The motor is not as powerful after a repair or service**
Tighten the nuts of the rear axle with the specified torque (40Nm/30lb-ft). If the problem is not solved please contact your dealer.

**The battery state of charge display on the console does not show "full" after a complete charging procedure**
Make sure that you have followed all of the instructions for the charging procedure. Let the battery cool off for a few hours and then recharge it again. If the problem's still not solved, let the battery cool again, fully deplete the battery and charge it again. If the problem persists, contact your authorized dealer.

# *Warranty Information and Guarantee*

**1.** The BionX warranty covers a two-year period for BionX propulsion system(s) within the framework of the following conditions.

**2.** This warranty exclusively covers systems provided by BionX excluding all the other bicycle components provided by other bicycle manufacturers.

**3.** This warranty covers the repair and/or the replacement of BionX propulsion systems provided that the equipment concerned loses its functionality within the agreed warranty period and also provided that the claim is not related to any of the following cases expressly excluded under this warranty.

**4.** Any other legal provisions, particularly with respect to warranty regulations, are not restricted by this warranty.

**5.** This warranty only covers material and manufacturing defects. It is only effective with a valid proof of purchase consisting of the original purchase document or receipt indicating the date of purchase, the dealer's name and the designation of the bicycle model. BionX reserves the right to reject the coverage of this warranty if the accompanying documentation of BionX components is not accurate or complete.

**6.** In the case of a warranty claim, BionX undertakes to either repair faulty system components and/or to replace such components, at BionX discretion (Service Replacement Unit).

**7.** Warranty repairs have to be exclusively performed by BionX. Any component to be repaired under the framework of this warranty has to be transferred to BionX at the client's own expenses and risks, and, after the completion of such repair, has to be picked up at BionX, or, it has to be shipped (at the request of the client) to the client's address at the client's own expenses and risks. In the case of rightful warranty claims, BionX reserves the right to bear or repay transportation expenses. In order to have a previous determination whether a warranty claim is justified or not, the end user has to submit his claim to the dealer from whom he purchased the product so that the respective dealer handles the shipment to BionX.

**8.** Costs for repair work performed in advance by persons who have not been authorized by BionX will not be reimbursed. In such a case, any warranty claim will cease.

**9.** Repair work and/or replacement of components during the warranty period do not lead to an extension and/or a new start of the warranty period. Repair work and direct replacement during the warranty period may be performed with functional replacement components of equal value.

**10.** The two-year warranty period starts with the date of purchase. Warranty claims must be reported immediately.

**11.** No warranty claims are accepted - without limitation to other reasons - in the case of damages due to the following:

a) External influences, particularly falling rocks, collision, accident and other external events with an immediate external effect due to mechanical powers.
b) Purpose and/or malevolent acts, theft and robbery as well as natural hazard events and/or acts of mischief.
c) Test, maintenance, repair and replacement work due to normal use.
d) If the battery/cell pack does not provide full capacity in the course of normal use or for batteries going through a normal aging process or reduction of performance, BionX warranty only covers that within the two-year warranty period or after 600 charging cycles, whichever event occurs first, to the condition that the battery still provides at least 70% of its initial capacity.
e) In the case of inappropriate use, e.g. the product was exposed to liquids, chemicals of any type and/or extreme temperatures, wetness and humidity and/or if the battery suffers damages due to non-compliance with the special instructions set forth in the chapter "Handling and Charging of the Battery".
f) The model, serial or product number on BionX product has been changed, deleted, blurred or removed. The seal (serial number sticker) on the battery housing has been broken or obviously manipulated.
g) Use of the battery in systems that are not approved for such use with this particular product.
h) Operation of the BionX system with batteries other than the batteries designed for the BionX system.
i) Damages to the battery due to overcharging or not adhering to the instructions of battery handling (refer to user manual).

**12.** This warranty only covers the above mentioned repair work and/or the replacement of defective or compromised components. It excludes any claims as to the reimbursement of property damages, downtimes, expenses for renting or leasing equipment, travel expenses, lost profit or any other claims. BionX liability in connection with this warranty is limited to the respective acquisition value of the product.

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Your dealer

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